

## **Feasibility Study of Superconducting Current Limiter Application in a Cogeneration Plant**

Alexander Henning, Axel Wehner, Michael Kurat

**Abstract**—Fault current limiters (FCL) are being developed using high temperature superconductors. Possible applications of FCL are medium and high voltage energy supply systems. In this field conventional protection against high currents often cause high expenses. Using a superconducting FCL gives an economic advantage, if technical problems can be solved at lower costs or if the usage of a FCL makes savings in other equipment possible. This work deals with possible applications of a superconducting fault current limiter within a medium voltage auxiliary power network of a typical small cogeneration power plant. For possible installation locations in the existing energy supply system of Braunschweig, Germany, calculations of short circuit currents were made. Thereby is kept track of the question, whether the power plant can be expanded while staying or becoming short-circuit-proof. One result of the work is that the auxiliary power system of the power plant is an especially interesting installation location for a FCL. Advantages of a FCL compared to conventional strengthening of the installations are discussed.

**Index Terms**—Fault current limiter, grid integration, simulation.

Manuscript received 15 August 2008.

Alexander Henning is with the Institut of Hochspannungstechnik und Elektrische Energieanlagen Technische Universität Braunschweig, P.O. 3329, D-38106 Braunschweig, Germany (telephone: +49+531 391 7759, fax: +49+531 391 8106, e-mail: [Al.Henning@tu-bs.de](mailto:Al.Henning@tu-bs.de)).

Michael Kurat is with the Institut of Hochspannungstechnik und Elektrische Energieanlagen Technische Universität Braunschweig, P.O. 3329, 38106 Braunschweig, Germany.

Axel Wehner is with the Institut of Hochspannungstechnik und Elektrische Energieanlagen Technische Universität Braunschweig, P.O. 3329, 38106 Braunschweig, Germany.